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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/903,916	07/12/2001	Prabir K. Dutta	OSU1159-144	1865

8698 7590 10/31/2003

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EXAMINER
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TRIEU, VAN THANH

ART UNIT	PAPER NUMBER
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2636

DATE MAILED: 10/31/2003

15

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/903,916

Applicant(s)

DUTTA ET AL.

Examiner

Van T Trieu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 October 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 and 27-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 and 27-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-5, 8-25 and 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by **Castro et al** [US 5,841,021].

Regarding claim 1, the claimed sensor comprising a substrate (substrate 16 having a first side and a second side and being made of some special doped ceramic material or combinations of polymers, see Fig. 1, col. 10, lines 47-58); and the first electrode (first electrode 12, 12' or 124' deposited on the first side of the substrate 16 or 136', see Figs. 1-5 and 19, col. 9, lines 19-67, col. 10, lines 1-21 and col. 20, lines 11-43); and the second electrode (second electrode 14, 14' or 126', see Figs. 1-5 and 19, col. 10, lines 22-46, col. 11, lines 1-33 and col. 20, lines 11-43); and the sensing material (multiplayer or multifunctional gas sensor 10 or 122 having electrodes 12, 14, 124 and 126 being connected to filter material having layers 48A, 48B and/or 52 that is selected to absorb certain predetermined contaminants such as carbon monoxide, carbon dioxide, oxides of nitrogen, oxides of sulfur, hydrides of nitrogen as ammonia, primary and secondary amines and hydrazine, hydrogen sulfide, hydrogen, methanol and ethanol, toxic or flammable gas as of reducing gas stream, to provide electrical voltage signal indicating

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to the amounts or levels of gas concentration being detected, see Figs. 17-20, col. 6, lines 37-53, col. 7, lines 23-25, col. 8, lines 63-67, col. 9, lines 45-67, col. 10, lines 1-46, col. 14, lines 59-67, col. 15, lines 1-23, col. 18, lines 46-67, col. 19, lines 1-67 and col. 20, lines 1-67).

Regarding claim 2, the claimed alumina (the substrate 16 or 136' is alumina , see col. 15, lines 49-65).

Regarding claim 3, the claimed first electrode is an interdigital electrode (the first electrode 12 or 12' provides a digital input, see col. 12, lines 20-24)

Regarding claim 4, the claimed second electrode is an interdigital electrode (the second electrode 14 or 14' provides a digital output, see col. 12, lines 20-24)

Regarding claim 5, the claimed halide (the sensing material is halide, see col. 10, lines 22-67).

Regarding claim 8, the claimed heater (the sensor 10 or 100 is heated by a temperature compensator electrode 128, see Figs. 1, 16 and 18, col. 11, lines 43-45, col. 18, lines 29-35, col. 19, lines 39-67 and col. 20, lines 1-10).

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Regarding claim 9, all the claimed subject matters are cited in respect to claim 8 above, see Fig. 18.

Regarding claim 10, the claimed electrical property (electrical voltage, see Figs. 6-10, 15 and 16).

Regarding claim 11, all the claimed subject matters are cited in respect to claim 1 above, and including the H2, see Figs. 1-20, col. 9, line 57.

Regarding claim 12, all the claimed subject matters are cited in respect to claim 11 above, see col. 4, lines 13-15.

Regarding claim 13, all the claimed subject matters are cited in respect to claim 11 above.

Regarding claim 14, all the claimed subject matters are cited in respect to claims 10 and 11 above,

Regarding claim 15, all the claimed subject matters are cited in respect to claim 1 above as the multiplayer or multifunction gas sensor and the oxidized agent, see col. 18, lines 46-67 and col. 19, lines 1-48.

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Regarding claim 16, all the claimed subject matters are cited in respect to claim 15 above, see col. 7, lines 57-63.

Regarding claim 17, all the claimed subject matters are cited in respect to claim 15 above and including the fuel cell in the chamber, see col. 9, lines 45-63.

Regarding claim 18, all the claimed subject matters are cited in respect to claim 15 above.

Regarding claim 19, all the claimed subject matters are cited in respect to claims 15 and 17 above.

Regarding claim 20, all the claimed subject matters are cited in respect to claims 10 and 15 above.

Regarding claim 21, all the claimed subject matters are cited in respect to claim 1 above.

Regarding claim 22, all the claimed subject matters are cited in respect to claim 21 above.

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Regarding claim 23, all the claimed subject matters are cited in respect to claim 21 above.

Regarding claim 24, all the claimed subject matters are cited in respect to claim 21 above.

Regarding claim 25, all the claimed subject matters are cited in respect to claims 1 and 5 above.

Regarding claim 27, all the claimed subject matters are cited in respect to claims 10 and 25 above,

Regarding claim 28, all the claimed subject matters are cited in respect to claim 25 above.

Regarding claim 29, all the claimed subject matters are cited in respect to claim 1 above, and including the conduits 19, 20, see Fig. 1, col. 11, lines 46-55.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Castro et al** [US 5,841,021] in view of **Tamaki et al** [US 6,311,545].

Regarding claim 6, **Castro et al** fails to disclose the sensing material is cuprous chloride. However, **Castro et al** teaches that the electrochemical gas sensor 10 or 122 for sensing/testing a plurality of different gases and volatile substance as diverse as carbon monoxide, carbon dioxide, oxides of nitrogen, oxides of sulfur, hydrides of nitrogen, and hydrogen sulfide. The multiplayer or multifunctional gas sensor 10 or 122 includes electrodes 12, 14, 124 and 126 being coated with sensing materials such as halide metal to provide electrical voltage signal indicating to the amounts or levels of gas concentration being detected, see Figs. 17-20, col. 7, lines 23-25, col. 8, lines 63-67, col. 9, lines 45-67, col. 10, lines 1-46, col. 18, lines 46-67, col. 19, lines 1-67 and col. 20, lines 1-67. **Tamaki et al** suggests that an anhydrous zinc anti-monate semiconductor gas sensor for detecting a various reducing gases such as hydrogen

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sulfide, hydrogen and fuel gases. The gas sensor device is coated with Cuprous Chloride (CuCl) material for detecting hydrogen sulfide, see Fig. 1, col. 1, lines 8-16, col. 4, lines 65-67, col. 5, lines 1-6, col. 8, lines 2-15. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the gas sensor of **Tamaki et al** for the electrochemical gas sensor of **Castro et al** since both gas sensors are designed to detect a plurality of different gases that including hydrogen and hydrogen sulfide gases to increase the detection functions of electrochemical gas sensor.

Regarding claim 7, all the claimed subject matters are discussed between **Castro et al** and **Tamaki et al** in respect to claims 1 and 6 above.

3. Any inquiry concerning this communication or earlier communications from examiner should be directed to primary examiner **Van Trieu** whose telephone number is (703) 308-5220. The examiner can normally be reached on Mon-Fri from 7:00 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. **Jeffery Hofsass** can be reached on (703) 305-4717.

The office facsimile number is (703) 872-9314.



**Van Trieu**  
**Primary Examiner**  
**Date: 10/29/03**